

10/564750

IAP15 Rec'd PCT/PTO 17 JAN 2006

ARTICLE 19 AMENDMENTS

AMENDMENT UNDER PCT ARTICLE 19

1. (cancelled)

2. (cancelled)

3. (amended) A method for fixing a metal particle,
including:

forming a resist film containing a resin component and a
metal-containing particle on a substrate; and

5 removing said resin component in said resist film and
fixing a metal particle on said substrate, said metal particle
including a metallic element that composes said metal-
containing particle,

10 wherein said metal-containing particle is a metallic
compound, and

wherein said method further includes heating said resist
film to a temperature of 300 degree C or higher and 1,200
degree C or lower within an inert gas atmosphere or a vacuum,
after said forming the resist film and before said removing
15 said resin component and fixing said metal particle.

4. (amended) The method for fixing the metal particle
according to claim 3, wherein said removing said resin
component and fixing said metal particle includes exposing said
resist film to a plasma atmosphere.

5. (amended) The method for fixing the metal particle

according to claim 3 or claim 4, wherein said removing said resin component and fixing said metal particle includes heating to a temperature of 300 degree C or higher and 1,200 degree C
5 or lower within an oxygen gas atmosphere.

6. (amended) The method for fixing the metal particle according to any one of claims 3 to 5, wherein said resist film is a negative-type resist film.

7. (amended) The method for fixing the metal particle according to any one of claims 3 to 6,

wherein said resist film is formed so as to cover the region where said metal particle is to be fixed, and

5 wherein said metal-containing particles in said resist film are aggregated to fix said metal particle to said region.

8. (amended) The method for fixing the metal particle according to any one of claims 3 to 7, further comprising providing an electrode so as to contact with said metal particle, after fixing said metal particle.

9. (amended) The method for fixing the metal particle according to any one of claims 3 to 7,

wherein an electrode is provided on a surface of said substrate, and

5 wherein said fixing the metal particle includes aggregating the metal-containing particles in said resist film to fix said metal particle on a surface of said electrode.

10. (amended) The method for fixing the metal particle according to claim 7 or claim 9, wherein said metal particle is one per independent pattern and is fixed.

11. (amended) The method for fixing the metal particle according to any one of claims 3 to 10, further including:
forming a diffusion barrier film on said substrate,
before said forming the resist film, and

5 wherein said fixing the metal particle on said substrate includes fixing said metal particle on said diffusion barrier film.

12. (not amended)

13. (not amended)

14. (not amended)

15. (amended) The method for fixing the metal particle according to claim 12 or claim 13, wherein said removing the organic compound constituent in the pattern and fixing the metal particle includes heating said pattern to a temperature
5 of 300 degree C or higher and 1,200 degree C or lower within an oxygen gas atmosphere.

16. (not amended)

17. (not amended)

18. (not amended)

19. (amended) The method for fixing the metal particle according to claim 16 or claim 18, wherein said metal particle is one per independent pattern and is fixed.

20. (amended) A method for manufacturing a metal particle-containing substrate, including the method for fixing the metal particle according to any one of claims 3 to 19.

21. (amended) A method for manufacturing a substrate containing carbon nanotube on a surface thereof, including:

fixing a metal particle on the substrate; and

allowing a growth of a carbon nanotube by a vapor

5 deposition process with a catalyst of said metal particle,

wherein said fixing said metal particle is conducted by the method for fixing the metal particle according to any one of claims 3 to 19.

22. (amended) A method for manufacturing a substrate containing a carbon nanotube on a surface thereof, including:

fixing a metal particle on the substrate;

disposing an amorphous carbon resin so as to cover said

5 metal particle; and

transferring said metal particle in said amorphous carbon resin by heating said substrate having said amorphous

carbon resin disposed thereon to allow the growth of the carbon nanotube in a region where said metal particle is transferred
10 to form a locus,

wherein said fixing said metal particle is conducted by the method for fixing the metal particle according to any one of claims 3 to 19.

23. (amended) A method for manufacturing a substrate containing a semiconductor crystal rod on a surface thereof, including:

fixing a metal particle on the substrate; and
5 allowing a growth of a crystalline rod of a semiconductor by a vapor deposition process with a catalyst of said metal particle,

wherein said fixing said metal particle is conducted by the method for fixing the metal particle according to any one
10 of claims 3 to 19.

24. (added) The method for fixing the metal particle according to claim 3, wherein said heating the resist film includes heating said resist film to a temperature of 400 degree C or higher and 800 degree C or lower within an inert
5 gas atmosphere or a vacuum.

25. (added) The method for fixing the metal particle according to claim 3 or claim 24, wherein said heating the resist film includes heating said resist film within a vacuum.

26. (added) The method for fixing the metal particle according to claim 10, wherein a particle diameter of said one metal particle is controlled by adjusting a concentration of the metallic element in said resist film.

27. (added) The method for fixing the metal particle according to claim 19, wherein a particle diameter of said one metal particle is controlled by adjusting a concentration of the metallic element in said pattern.

28. (added) The method for fixing the metal particle according to claim 26,

wherein said forming the resist film includes leaving a predetermined volume of said resist film on said substrate, and

5 wherein a particle diameter of said one metal particle is controlled by adjusting said volume of said resist film and a concentration of the metallic element in said resist film.

29. (added) The method for fixing the metal particle according to claim 27,

wherein said forming the pattern includes depositing a predetermined volume of said pattern on said substrate, and

5 wherein a particle diameter of said one metal particle is controlled by adjusting said volume of said pattern and a concentration of the metallic element in said pattern.

30. (added) The method for fixing the metal particle according to claim 3,

wherein said forming the resist film includes:

forming a first resist film that is free of said metal-
5 containing particle; and

forming a second film containing said metal-containing
particle after said forming the first resist film.

31. (added) A method for manufacturing a substrate
containing a carbon nanotube on a surface thereof, including:
fixing a metal particle on the substrate; and
allowing a growth of a carbon nanotube by a vapor
5 deposition process with a catalyst of said metal particle,

wherein said fixing said metal particle is conducted by
the method for fixing the metal particle according to any one
of claims 26 to 29.

32. (added) The method for manufacturing a carbon nanotube-
containing substrate according to claim 22,
wherein said disposing the amorphous carbon resin
includes forming a predetermined geometry of a patterned
5 amorphous carbon resin on said substrate, and

wherein said allowing the growth of the carbon nanotube
includes moving said metal particle within said patterned
amorphous carbon resin to allow the growth of said carbon
nanotube, thereby forming a graphite pattern.

33. (added) A method for manufacturing a substrate containing a
semiconductor crystal rod on a surface thereof, including:

fixing a metal particle on the substrate; and

allowing a growth of a crystalline rod of a semiconductor by
5 a vapor deposition process with a catalyst of said metal particle,
wherein said fixing said metal particle is conducted by the
method for fixing the metal particle according to any one of claims
26 to 29.